Rymer, Edwina

From: Dorsey, Nancy
Sent: Thursday, April 09, 2015 9:39 AM
To: R6 6WQ-SG;Lawrence, Rob
Cc: Hildebrandt, Kurt;Bates, William
Subject: FW: Requested Article: Earth and Planetary Science Letters 2014; 405: 274-80
Attachments: Optimizing multi-station earthquake template matching through re-examination of Youngstown, Ohio sequence.pdf

With respect to Continental's claims, the authors did investigate any increase due to the Tohoku (M9) and Virginia (M5.8) earthquakes, see Section 3.3 and Figure 7. They found a possible slight increase following Tohoku, but none from Virginia.

Figure 4 is a wonderful example of the value of relocating seismic events!

4. Conclusions

Creating an optimized correlation procedure was important to provide a more detailed study of the Youngstown sequence that can also be applied to study the large increase in earthquake ac-tivity in the U.S. midcontinent identified by Ellsworth(2013). The ideal template matching parameters for the Youngstown sequence were determined by modifying the stations used, bandpass filter range, template length, and template start time. The resulting catalog from this routine was consistent with the sequence determined by Holtkamp et al.(2013), while also identifying hundreds of additional events. The hypoDD results located the start of Youngstown sequence within 100 m of the Northstar 1 injection well which then gradually extended 500 m westward during 2011. We suggest that the earthquake migration front, which was observed to have a similar trend to the daily average injection pressures, could be influenced by decaying diffusivity over time, possibly caused by clogging due to injection. A b-value of <1 was observed for the entire sequence, consistent with other fluid induced seismicity studies. We also note that the abnormally high b-value of 1.92 dur-ing phase 2 is comparable to b-values obtained during hydraulic fracturing.

From: Bates, William
Sent: Thursday, April 09, 2015 9:14 AM
To: Dorsey, Nancy
Subject: FW: Requested Article: Earth and Planetary Science Letters 2014; 405: 274-80

Here is the first article

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202-564-6165

From: Yankowski, Jessica
Sent: Thursday, April 09, 2015 9:21 AM
To: Bates, William
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